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NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

THE USE OF THE MARINE CORPS
STANDARD ACCOUNTING, BUDGETING AND
REPORTING SYSTEM TO MEET DATA REQUIREMENTS
OF THE COMMERCIAL ACTIVITIES PROGRAM

by

Jack DeWayne Larson

June 1982

Thesis Advisor: R. A. Bobulinski

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This thesis examines present methodology in the Marine Corps for obtaining data required in support of the Commercial Activities (CA) inventory report and the cost comparison analysis. It also presents a proposal for improving on present procedures by tasking the Marine Corps' Standard Accounting, Budgeting and Reporting System (SABRS) with meeting CA data requirements. In addition to an author-conducted survey of present procedures

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The Use of the Marine Corps Standard Accounting, Budgeting and Reporting System to Meet Data Requirements of the Commercial Activities Program

by

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Submitted in partial fulfillment of the
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This thesis examines present methodology in the Marine Corps for obtaining data required in support of the Commercial Activities (CA) inventory report and the cost comparison analysis. It also presents a proposal for improving on present procedures by tasking the Marine Corps' Standard Accounting, Budgeting and Reporting System (SABRS) with meeting CA data requirements. In addition to an author-conducted survey of present procedures for CA data extraction, background information is provided on the CA Program. A discussion is also provided on the objectives, design characteristics, hardware configuration, and software capability of SABRS. The purpose of this discussion is to highlight capabilities and design characteristics that lend themselves to CA data requirements. System impact is presented in a separate chapter which is intended to serve as a working document in relating CA user needs to SABRS system designers. Conclusions and recommendations focus on specific managerial actions that the author feels are important to improving the efficiency and effectiveness of CA data extraction in the Marine Corps.

TABLE OF CONTENTS

I. INTRODUCTION ---------- 9

A. THESIS PROBLEM STATEMENT ---------- 9

B. RESEARCH QUESTIONS AND THESIS OBJECTIVES ------- 13

C. SCOPE, LIMITATIONS, ASSUMPTIONS ---------- 14

1. Scope ---------- 14

2. Limitations ---------- 15

3. Assumptions ---------- 15

D. RESEARCH METHODOLOGY ---------- 16

E. CHAPTER SUMMARY ---------- 17

II. COMMERCIAL ACTIVITIES PROGRAM ---------- 20

A. INTRODUCTION ---------- 20

B. BACKGROUND ---------- 20

C. IMPLEMENTING DIRECTIVES ---------- 23

1. Cost Comparison Handbook (CCH) ---------- 23

2. Department of Defense Directive (DoDD) 4100.15, Commercial and Industrial Type Activities, 4 February 1980 ---------- 27

3. Department of Defense Instruction (DoDI) 4100.33, Operation of Commercial and Industrial Type Activities, 24 April 1981 --- 28

4. Marine Corps Order (MCO) 4860.3B, Operation of Commercial and Industrial Type Activities, 24 April 1981 ---------- 28

D. INVENTORY REQUIREMENTS ---------- 30

1. General ---------- 30

2. Data Elements ---------- 30

3. Additional Requirements ---------- 34

E. FIELD LEVEL ADMINISTRATION ---------- 35

1. Organization ---------- 36

2. Methodology ---------- 38

3. Manhours Expended ---------- 40

4. Turnover ---------- 40

5. Inadequate Guidance ---------- 41

F. SUMMARY ---------- 43

III. STANDARD ACCOUNTING, BUDGETING AND REPORTING SYSTEM (SABRS) ---------- 44

A. INTRODUCTION ---------- 44

B. BACKGROUND ---------- 44

1. References ---------- 44

2. General ---------- 44

3. Objectives ---------- 45

4. Status ---------- 47

C. GENERAL SYSTEMS DESIGN ---------- 48

1. Data Accumulation ---------- 49

2. Data Base Update ---------- 51

3. Special Financial Functions ---------- 53

4. Information Production ---------- 54

D. SUPPORT ENVIRONMENT ---------- 55

1. Configuration ---------- 55

2. Hardware ---------- 57

3. Software ---------- 57

4. Data Base Management System (DBMS) -------- 59
E. SUMMARY ---------- 61
IV. COMMERCIAL ACTIVITY REPORTING AS A PART OF SABRS --- 63
A. OVERVIEW ---------- 63
B. OPERATIONAL FEASIBILITY ---------- 64
1. General ---------- 64
2. Resource Management System (RMS) ---------- 64
3. SABRS ---------- 66
4. CA Data Requirements ---------- 66
C. TECHNICAL FEASIBILITY ---------- 68
1. System Impacts ---------- 68
2. Data Base Management System ---------- 69
D. ECONOMIC FEASIBILITY ---------- 70
1. Cost Savings ---------- 70
2. Other Benefits ---------- 74
E. SUMMARY ---------- 75
V. FUNCTIONAL REQUIREMENTS ---------- 76
A. GENERAL ---------- 76
1. Purpose ---------- 76
2. References ---------- 76
B. SYSTEM SUMMARY ---------- 76
1. Background ---------- 76
2. Objectives ---------- 77
3. Existing Methods and Procedures ---------- 77
4. Proposed Methods and Procedures ---------- 77
5. Assumptions and Constraints ---------- 79

C. DETAILED CHARACTERISTICS ---------- 80
1. Specific Performance Requirements --------- 80
2. Functions ---------- 81
3. Inputs-Outputs ---------- 81
4. Data Characteristics ---------- 84
5. Failure Contingencies ---------- 90
D. ENVIRONMENT ---------- 91
1. General ---------- 91
2. Security and Privacy ---------- 91
E. DEVELOPMENT PLAN ---------- 92
F. SUMMARY ---------- 92
VI. CONCLUSIONS AND RECOMMENDATIONS ---------- 95
A. SUMMARY ---------- 95
B. CONCLUSIONS ---------- 98
C. RECOMMENDATIONS ---------- 100
D. SUGGESTIONS FOR FURTHER STUDY ---------- 102
APPENDIX ---------- 103
LIST OF REFERENCES ---------- 105
INITIAL DISTRIBUTION LIST ---------- 108

I. INTRODUCTION

A. THESIS PROBLEM STATEMENT

The United States Federal Government's involvement in activities that, by their nature could be performed by the private sector, was officially recognized as early as 1932 by the First Hoover Commission [Ref. 1]. The Commission expressed concern over this fact, and efforts to implement a policy of reliance on the private sector to provide goods and services have since ranged in degree of visibility from non-existent to the present relatively high level. Revision 4 to the Office of Management and Budget (OMB) Circular No. A-76, Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government (A-76), issued on 29 March 1979, contains the most recent policies and guidance pertaining to the management of the Commercial Activities (CA) Program.

In conjunction with this most recent revision to A-76, a supplemental Cost Comparison Handbook (CCH) was issued. It provides standard cost figures and procedures for preparing the Government's cost estimate [Ref. 2]. The requirement for such specific guidance was documented in 1978 in a General Accounting Office (GAO) report to Congress [Ref. 3]. This report identified uncertainties as to the proper costing

approach to use (i.e. incremental or full) and the accuracy of standard cost factors.

Although the CCH represents a step in the right direction, it is the opinion of the author that it is not enough to eliminate the opportunity for controversy that is the result of groups acting on the basis of their own special interests. Such controversy has been and will continue to be generated by government employee organizations which recognize that an aggressive policy of reliance on the private sector can be translated into a loss of jobs in the public sector. Only by proving that "in-house" performance is less costly or that an inherently governmental function is involved can conversion be avoided. As set forth in A-76, a determination that a governmental function is involved must receive approval at the "military department assistant secretary level or equivalent in the defense agencies" [Ref. 4] which provides some indication of the importance attached to it.

Government employee organizations are not alone in their capability to generate controversy. Commercial contractors have an interest in insuring that they get as much of the Government's business as possible. They argue that they can operate more effectively and efficiently than in-house operations but are not given an opportunity to do so by the agencies performing the commercial activities in question [Ref. 5].

Congress has also maintained an active interest in implementation of the CA Program since A-76 and has passed legislation that impacts directly upon it [Ref. 6]. Examples of such legislation cited in the reference include a moratorium and language written in an authorization. In fiscal year 1978 (FY 78), a moratorium was placed on conversion of all commercial activities to contract performance if the conversion would result in a reduction to the number of government employees. Section 806 of the Department of Defense (DoD) Authorization Act, 1980, prohibited conversion of DoD commercial activities to contract performance when the purpose was to circumvent personnel ceilings. It further required that proposed conversions be preceded by a study of which Congress was notified and that notification, certification, and reporting requirements be met prior to actually converting to contract performance.

Because controversy and Congressional interest are factors impacting on the CA Program, those tasked with implementing it must not leave themselves vulnerable through procedural errors and misunderstandings. Inventories and cost comparisons must be accurate and beyond question as to the methodology used in developing them. However, development of a Government cost estimate is a specific example of an area in which errors or misunderstandings can occur. Although the CCH provides a considerable amount of procedural guidance, the author feels that

there is still opportunity for misinterpretation or misapplication. This results in delays in completion of the overall review process and the opportunity for refutation by special interest groups opposed to the course of action dictated by the cost comparison.

As at least a partial solution, it is the contention of the author that information related to the CA Program and the management of fiscal resources must share a more common identity. This would seem obvious since cost comparisons and inventories are expressed in terms of fiscal resources. However, in spite of the automated budgeting and reporting systems in existence in each branch of DoD, personal experience and discussion with other CA representatives have shown that inventories and cost comparisons are still done manually with limited use of automated systems. Data is laboriously extracted from various financial reports that are generated by the systems. In converting the data to meet CA requirements, informal interviews indicate that considerable cost and potential for error are incurred. Analysts are required to spend time on data extraction and conversion rather than on the analysis of the data for validity, accuracy, and relevance to other applications (e.g. financial accounting).

It is further the author's contention that financial reporting systems, whose objective is to provide management information in addition to accounting reports, must address

CA reporting requirements. CA reports provide management information that has significant impact. The point that information must be accurate and timely, yet produced in the most efficient manner, was stressed by practitioners during the course of interviews.

B. RESEARCH QUESTIONS AND THESIS OBJECTIVES

The Marine Corps Standard Accounting, Budgeting and Reporting System (SABRS) is a new system which is still in the development phase. It is the objective of this thesis to determine if it is feasible to make CA reporting requirements a part of SABRS. If the determination is made that it is feasible, then the author will focus on any modifications or additions that must be made to design specifications to accomodate CA reporting requirements.

1. Who is presently responsible for CA reporting requirements at Marine Corps bases and stations?

2. What are the methods for conducting inventories and cost comparisons at present?

3. What is the potential for relating CA functional and subfunctional codes to Department of the Navy standard Cost Account Codes?

4. How are relationships presently drawn between CA data requirements and data that is resident in financial records or reports?

5. What are the system and support environment capabilities of SABRS that lend themselves to CA applications?

6. Depending on the degree of addressal identified in number 5 above, what additional capabilities, expressed as functional requirements, must be included in design specifications?

7. What additional data base maintenance costs are incurred by including data elements unique to CA in the data base? What is the relationship of these costs to the costs incurred in manual preparation of reports?

8. To what degree might accuracy be improved by automating CA reporting requirements?

C. SCOPE, LIMITATIONS, ASSUMPTIONS

1. Scope

Although this thesis addresses both inventories and cost comparisons as CA reporting requirements, its emphasis is on inventories. It is the author's opinion that the inventory process possesses the greatest potential for immediate addressal in financial reporting systems using electronic data processing. However, any area of the thesis which also applies to preparation of the cost comparison will be so identified.

Attention is directed towards the specific relationship between CA reporting and SABRS. It is not within the scope of this presentation to do more than identify general areas of commonality existent in the financial reporting

systems of other DoD activities. However, in the author's opinion, it is not unreasonable to assume that conclusions and recommendations drawn concerning SABRS would also apply, at least in part, to other financial reporting systems.

2. Limitations

The only limitation encountered was in the lack of finalized SABRS documentation. Other than the Executive Summary and Automated Data System Development (ADS) Plan which have been finalized, documentation is in its draft form. The author does not feel, however, that changes in documentation will significantly affect data contained in this presentation. As is further developed in subsequent chapters, the author contends that the advantages of this situation exceed the limitations.

3. Assumptions

It is assumed that the commonality the author contends presently exists between CA reporting requirements and the management of fiscal resources will continue. In other words, the amount of fiscal data required in an inventory or cost comparison will remain the same or increase, justifying the use of a financial reporting system. It is also assumed that the objectives, especially as they pertain to management information requirements, will remain unchanged for SABRS.

D. RESEARCH METHODOLOGY

Data for this research effort was obtained from a number of sources utilizing varied methods of collection. Analysis of existing directives was conducted as a means of documenting specific CA reporting requirements. To document present procedures and problems encountered in meeting these requirements, an investigation of recent theses, GAO reports, and articles in professional journals was made by the author.

Interviews, either by telephone or in person, were conducted with CA representatives at all Marine Corps bases and stations tasked with management of a CA Program. The purpose of these interviews was to document the organizational tasking, specific procedures used, and hours spent for the purpose of meeting CA reporting requirements. Data obtained from these interviews was used to document variations in procedure and tasking between commands and to emphasize the magnitude of effort expended.

A review was made of the most current SABRS documentation. This included the Executive Summary, Automated Data System Development (ADS) Plan, Data Elements Dictionary, Functional Requirements Document, and General Systems Design. The goal was not to obtain the level of information required to provide a comprehensive analysis. Rather, the purpose was to be able to provide a general overview of the intended features of SABRS. Detail is restricted to an analysis of the SABRS concept

for a data base management system shared with other management information systems, and report generation capability.

Since SABRS documentation is still evolving, discussions were held with personnel responsible for SABRS development. Specifically, discussions were held with the Accounting Officer of the Marine Corps and members of the SABRS development team. The primary objective of these discussions was to obtain an understanding of SABRS and the latest status of its development. However, it was also considered important to promote the idea of integrating CA reporting requirements into SABRS and to establish an exchange of thoughts/experiences that would serve to identify problems in implementing such a concept.

E. CHAPTER SUMMARY

This chapter introduced the thesis problem, established the objectives of the research and the questions to be answered in meeting those objectives. It also defined the scope of the presentation.

Chapter II provides the background information necessary to gain an understanding of the CA Program to include reporting requirements. Specific requirements set forth in applicable directives relative to the inventory are identified. Current procedures in the Marine Corps for meeting CA inventory requirements are then examined. Attention is drawn to manual procedures for data collection and information

presentation that closely resemble automated procedures in accounting systems.

An overview of SABRS is presented in Chapter III. The discussion centers on the general systems and the support environment. The material in this chapter serves as the basis for addressing the capability of SABRS to generate a CA inventory report, or respond to the queries of those developing government cost estimates.

Chapter IV examines SABRS in terms of the capabilities set forth in Chapter III as a system in which CA reporting requirements can potentially be addressed. Technical and economical feasibility are examined. Also, policy issues that must be resolved as a condition for accurate and consistent CA reporting in either a manual or automated environment are discussed.

Chapter V sets forth the functional requirements for CA reporting using electronic data processing. This is done in accordance with established standards and directives for preparation of functional requirements. It is intended that this chapter serve as a link between the users of data relative to the CA Program and SABRS designers.

In Chapter VI, conclusions are drawn as to the feasibility of integrating CA reporting requirements into SABRS, and the degree of integration. Recommendations are then made concerning the course of action to be pursued by the Fiscal Division,

Headquarters Marine Corps during the remaining stages of SABRS development and implementation. Recommendations are also made as to other staff involvement in resolving policy issues.

II. COMMERCIAL ACTIVITIES PROGRAM

A. INTRODUCTION

This chapter provides an overview of Revision No. 4 to the Office of Management and Budget (OMB) Circular No. A-76, Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government (A-76). It further discusses the directives published by the Department of Defense (DoD) and the Marine Corps for the purpose of implementing the policies contained in A-76. Finally, it presents the results of a survey of procedures currently used in dealing with the requirements established by A-76 and/or implementing directives. The purpose of the chapter organization as described is to familiarize the reader with the Commercial Activities (CA) Program and to impress upon him or her the extent of the managerial, administrative, and clerical involvement with it.

B. BACKGROUND

> "In a democratic free enterprise economic system, the Government should not compete with its citizens. The private enterprise system, characterized by individual freedom and initiative, is the primary source of national economic strength. In recognition of this principle, it has been and continues to be the general policy of the Government to rely on competitive free enterprise to supply the products and services it needs." [Ref. 7]

The above stated policy, contained in A-76, is a reiteration of policy contained in previous versions and Bureau of

the Budget (BoB) Bulletins dating back to 1955. Even if taken literally, however, this policy still leaves a requirement for administering contracts with private entrepreneurs, including the attendant functions of competitive procurement and payment to the suppliers of goods and services. There is an implication that certain inherently governmental functions must exist. These are recognized in A-76 and categorized as those involving the discretionary application of Federal Government authority, monetary transactions and entitlements (e.g. paying of vendors), and in-house core capabilities in the area of research, test and development [Ref. 8].

In addition to governmental functions, certain commercial activities performed by military personnel may also be excluded from performance by the private sector. As set forth in A-76, qualifying activities are those essential for training in military skills, those manned by deployable personnel, or those needed to provide appropriate work assignments for career progression or a rotation base. In short, recognition is given to the fact that military personnel are not always in an overseas or combat environment where A-76 does not apply. They must still be gainfully employed, and they must be permitted to obtain the level of experience and training required to perform overseas or in combat [Ref. 9].

A-76 also makes provision for the situation in which no satisfactory commercial source is available. Such would be the case when there is no private source capable of providing

the product or service, or the use of a private commercial source would cause an unacceptable delay of an agency program. Either of these determinations must be documented. Before concluding that no satisfactory commercial source exists, advertisements must be placed in the Commerce Business Daily for a 90-day period. Assistance must also be obtained from the General Services Administration, Small Business Administration, and the Department of Commerce. Cost, time loss, and performance degradation of a lasting nature constitute the only acceptable justification for arguing unacceptable delay or disruption [Ref. 10].

The final condition under which Government performance of a commercial activity can be justified is cost. A-76 states:

> "A Government commercial or industrial activity may be authorized if a comparative cost analysis, prepared in accordance with paragraph 9 of this Circular, indicates that the Government can provide or is providing a product or service at a lower cost than if it were obtained from a private commercial source." [Ref. 11]

Compare this quotation with the earlier one relative to reliance on the private sector. First, it is stated that the Government should not compete with its citizens. However, it would seem that a determination that the Government should provide a product or service because of lower cost is nothing more than a recognition of competitive advantage. It is the opinion of the author that reliance on the private sector is an ideal; inherently governmental functions, training of military personnel, and lower costs have surfaced as practical,

everyday considerations that cannot be ignored. Given this apparent contradiction between theory and reality, the author contends that implementation of the CA Program presents a management problem of non-trivial magnitude.

C. IMPLEMENTING DIRECTIVES

A-76 directs executive agencies to "promulgate this Circular with the minimum necessary internal instructions." The following represent implementing directives either identified in A-76 or developed by the Secretary of Defense and the Marine Corps.

1. Cost Comparison Handbook (CCH)

As a supplemental to A-76, it is the purpose of the CCH to provide detailed instructions for developing the Government cost estimate and comparing it with the contract cost for the same product or service [Ref. 12]. Figure II-1 is the Cost Comparison Form that is to be used for this process. In addition to providing specific instructions for conducting the Government cost estimate, the CCH sets forth common ground rules:

a. The same scope of work and the same level of performance must be used for both Government and contract cost figures;

b. Standard cost figures set forth in the CCH will be used;

c. Full costing, to the maximum extent practical will be applied (including allocation of overhead and indirect costs);

(DEPARTMENT OR AGENCY)

COMPARATIVE COST OF IN-HOUSE AND CONTRACTING-OUT
PERFORMANCE OF (PRODUCT/SERVICE)

(Date)

LINE #	Cost Element	FIRST YEAR	SECOND YEAR	THIRD YEAR	ADDITIONAL YEARS AS APPROPRIATE	TOTAL	REFERENCE
	IN-HOUSE PERFORMANCE (CHAPTER III)	(Enter Amounts Rounded to Nearest Dollar)					
1.	DIRECT MATERIAL						A
2.	MATERIAL OVERHEAD						B
3.	DIRECT LABOR						C
4.	FRINGE BENEFITS ON DIRECT LABOR						D
5.	OPERATIONS OVERHEAD						E
6.	OTHER DIRECT COSTS						F
7.	GENERAL AND ADMINISTRATIVE EXPENSE						G
8.	INFLATION	Not applic.					H
9.	TOTAL						
	PERFORMANCE BY CONTRACTING-OUT (CHAPTER IV)						
10.	CONTRACT PRICE						I
11.	TRANSPORTATION						J
12.	CONTRACT ADMINISTRATION						K
13.	GOVERNMENT-FURNISHED PROPERTY						L
14.	STANDBY MAINTENANCE						M
15.	OTHER COSTS						N
16.	GENERAL AND ADMINISTRATIVE EXPENSE						O
17.	TOTAL						

Figure II-1

LINE #	Cost Element	FIRST YEAR	SECOND YEAR	THIRD YEAR	ADDITIONAL YEARS AS APPROPRIATE	TOTAL	REFERENCE
	OTHER CONSIDERATIONS (CHAPTER V)						
	ADDITIONS AND (DEDUCTIONS) TO IN-HOUSE PERFORMANCE						
	ADD:						
18.	COST OF CAPITAL						P
19.	ONE-TIME NEW-START COSTS						Q
20.	OTHER COSTS						R
	DEDUCT:						
21.	OTHER COSTS	( )	( )	( )	( )	( )	S
22.	TOTAL						
	ADDITIONS AND (DEDUCTIONS) TO CONTRACTING-OUT PERFORMANCE						
	ADD:						
23.	COST OF CAPITAL ON GOV'T-FURNISHED FACILITIES						T
24.	UTILISATION OF GOVERNMENT CAPACITY						U
25.	ONE-TIME CONVERSION COSTS						V
26.	OTHER COSTS						W
	DEDUCT:						
27.	FEDERAL INCOME TAXES	( )	( )	( )	( )	( )	X
28.	NET PROCEEDS FROM DISPOSAL OF ASSETS (ANNUAL VALUE)	( )	( )	( )	( )	( )	Y
29	OTHER COSTS	( )	( )	( )	( )	( )	Z
30.	TOTAL						
	MINIMUM COST DIFFERENTIAL (CHAPTER VI)						
31.	NEW-START						AA
32.	CONVERSION						BB
	SUMMARY						
33.	ADJUSTED COST OF IN-HOUSE PERFORMANCE (LINE 9 ± LINE 22 + 31)						
34.	ADJUSTED COST OF CONTRACTING-OUT PERFORMANCE (LINE 17 ± LINE 30 + 32)						
35.	COST OF IN-HOUSE OVER (UNDER) COST OF CONTRACTING-OUT PERFORMANCE (LINE 33 - LINE 34)						

Figure II-1 (cont.)

IN-HOUSE ESTIMATE PREPARED BY:

(Name) (Date)

(Title) (Telephone)

COST COMPARISON PREPARED BY:

(Name) (Date)

(Title) (Telephone)

APPROVED BY:

(Name) (Date)

(Title) (Telephone)

AUDIT CERTIFICATION

We have reviewed the above form and substantiated the currency, accuracy, and completeness of the data. We further verified that the procedures followed were in compliance with OMB Circular A-76 and the related Cost Comparison Handbook.

PERFORMANCE RECOMMENDATION (IN-HOUSE OR CONTRACT) APPROVED BY:

(Name) (Date)

(Title) (Telephone)

(Name) (Date)

(Title) (Telephone)

Figure II-1 (cont.)

d. Prepriced options will be obtained for services or products required on a continuing basis;

e. Cost comparisons will not be conducted to justify Government performance for services or products estimated to cost the Government less than $100,000 in annual operating costs unless evidence exists that commercial prices are unreasonable;

f. A rate of return of ten percent will be used on capital expenditures.

2. Department of Defense Directive (DoDD) 4100.15, Commercial and Industrial Type Activities, 4 February 1980

This directive specifically relates the requirements set forth in A-76 to DoD components (Office of the Secretary of Defense (OSD), the Military Departments, the Organization of the Joint Chiefs of Staff, the Unified and Specified Commands, and Defense Agencies). It limits the applicability of the CA Program to DoD activities in the United States, its territories and possessions, and the Commonwealth of Puerto Rico. Further, consistent with A-76, it identifies those areas in which it does not apply such as governmental functions, nonappropriated fund instrumentalities, and research, development, test and evaluation whose funds are required to be authorized by Title 10 of the U.S. Code. Finally, it assigns specific responsibilities to the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics) for policy formulation, and to the Secretaries of the Military Departments

for such decisions as approval/disapproval of new starts [Ref. 13].

3. Department of Defense Instruction (DoDI) 4100.33, Operation of Commercial and Industrial Type Activities, 24 April 1981

As the designation, "instruction," versus "directive" implies, DoDI 4100.33 is more explanatory than directive in nature. It defines those activities found within DoD which meet the criteria of a commercial activity and are therefore subject to the provisions of A-76. It serves as the basis for component directives relative to the conduct of reviews, cost comparison analyses, and inventories [Ref. 14].

4. Marine Corps Order (MCO) 4860.3B, Operation of Commercial and Industrial Type Activities, 24 April 1981

This directive reiterates the policy and principles set forth in all of the preceding directives and provides specific guidance for implementation of the CA Program in the Marine Corps.

a. Review

The purpose of the review is to determine whether the present method of performance should be continued or scheduled for a cost comparison analysis. Headquarters Marine Corps (HQMC) was tasked with preparing a five-year review schedule in which all commercial activities in the Marine Corps would be reviewed. A review schedule has been published by means of a bulletin in the 4860 series. The use of a bulletin

permits required adjustments to the review schedule in subsequent renewals of it [Ref. 15].

b. Cost Comparison Analysis

Assuming that a commercial activity cannot be properly excluded for reasons of national defense and that satisfactory commercial sources are available, an activity is required to be scheduled for a cost comparison analysis. The purpose of the cost comparison is to determine whether or not a change in the method of performance is merited.

Actual conduct of the cost comparison analysis can only occur subsequent to authorization by Headquarters Marine Corps. It involves a simultaneous solicitation of bids from commercial sources and the preparation of a government cost estimate based on the Statement of Work (SOW). The in-house, or Government estimate, must be "based on an estimate of the most efficient and cost-effective organization for performance of the work described in the SOW" [Ref. 16]. It is suggested that manpower surveys, management studies, audit reports, and union involvement are means by which such a determination of efficiency and effectiveness might be made.

Integrity and total objectivity of personnel involved in the cost analysis process are stressed. As additional assurance of integrity, an independent audit of the in-house cost estimate by the Naval Audit Service is required for estimates greater than $100,000 in direct labor, materials

and supplies. Actual results of the cost comparison analysis must be forwarded to Headquarters Marine Corps for review and opportunity for administrative appeal prior to final action (e.g. conversion) [Ref. 17].

D. INVENTORY REQUIREMENTS

1. General

In addition to guidance pertaining to reviews and cost comparisons, MCO 4860.3B provides specific guidance for conducting an inventory. All Marine Corps commands performing, or contracting for the performance of, functions of a commercial nature are tasked with compiling and maintaining an inventory of these functions. The inventory must be submitted to the Commandant of the Marine Corps on keypunched cards by 21 November following the end of the fiscal year being reported.

2. Data Elements

Following is a list of data elements that must be included in the inventory. They are presented in terms of in-house and contract performance:

a. In-house

(1) Designator. The letter, "A," is used to designate that the function is performed in-house.

(2) State, Territory, or Possession. A two digit numeric code identifies the geographical location of the reporting command.

(3) Unit Identification Code (UIC). A six digit alphanumeric code identifies the reporting command itself.

(4) Function. A five digit alphanumeric code identifies the particular function or subfunction that is being reported.

(5) In-house Civilian Workload. This represents the total (full and part-time) civilian work-year equivalents including supervisory, administrative and supply contributions applied directly to the performance of the function or sub-function during the fiscal year. It is computed by dividing the number of hours charged to the function by 2080.

(6) Military Workload. This is the same as (5) except that military labor versus civilian labor is reported.

(7) Total Cost of Labor. This represents the total cost of the work year equivalents in (5) and (6). For civilian labor, it includes the annual pay for labor and leave plus the cost for retirement, social security, disability, health, and life insurance. For military labor, it is computed on the basis of composite standard rates found in DoDD 4100.33-H.

(8) Total Cost of Supplies and Material. The total annual cost to the Government for supplies and material used in the performance of the function during the fiscal year must be determined. This includes annual lease costs for commercial supplies, equipment, and facilities required to perform the function in-house.

(9) Total Cost of Facilities and Equipment. This is defined as the acquisition cost of Government-owned facilities and equipment employed in the performance of the function. The increased value of a facility resulting from additional capital investment for rehabilitation, modification, or expansion must be added to the original investment cost. Facilities used for more than one function must be prorated on the basis of square footage occupied. Equipment used in more than one function must be prorated on the basis of usage.

(10) Reason for In-house Operation. This is a one digit alpha code that gives the reason for performing the function in-house (e.g. national defense, no satisfactory commercial source, etc.).

(11) Most Recent Year In-house Operation Approved. There is no entry made for this data element if the method of performance has not been reviewed and approved.

(12) Year CA Scheduled for Next Review. The review schedule published by HQMC is used as the basis for this entry.

(13) Program Element. This is a six character alphanumeric code associated with the UIC described in (3).

(14) Cost Comparison Study Number. This is a nine digit number used to track CA's performed in-house on the basis of least cost. These numbers are assigned by the Office of the Secretary of Defense (OSD) and transmitted to affected commands by HQMC.

b. Contract Performance

(1) Designator. The letter "B" is used to designate that the function is performed by contract.

(2) State, Territory, or Possession. Same guidance as a(2).

(3) Unit Identification Code (UIC). Same guidance as a(3).

(4) Function. Same guidance as a(4).

(5) Contract Number. This is a thirteen character alphanumeric for the DoD contract number associated with the procurement for goods and services being reported.

(6) Source. This is a six character alphanumeric corresponding to the contractor's code. It is left blank if the contract being reported is under $100,000.

(7) Effective Date of Award. Two digit numeric codes are used to represent the year and month respectively that the contract being reported was awarded. It is left blank for contracts under $100,000.

(8) Estimated Completion Date. Two digit numeric codes are used to represent the year and month respectively that the term of the contract expires. It is also left blank for contracts under $100,000.

(9) Contract Work-Year Equivalents. This represents the actual contractor work-years employed in performance of the function, or an estimate based on what the work-years would have been for the same level of performance in-house.

(10) Contract Cost. The total annual cost of service contracts executed during the fiscal year is reported. This includes incentive premium payments made to contractors.

(11) Reason for Contract Performance. This is a one digit alpha character that indicates contract performance is cheaper, secured for reasons other than cost, or pending the results of a cost comparison.

(12) Most Recent Year Contract Approved. This is left blank if the contract performance has not been reviewed and approved.

(13) Year Contract Scheduled for Next Review. The review schedule published by HQMC serves as the basis for this entry.

(14) Program Element. Same as a(13).

(15) GOCO Code. This is a one digit alpha character that designates whether facilities and equipment used in performance of the function are Government owned/contractor operated, or owned and operated by the contractor.

(16) Small Business. A two digit alpha code is used to indicate a small business set-aside or Section 8(a) Small Business Act Contract.

3. Additional Requirements.

All previous discussion relative to conduct of the inventory has centered on functions of a commercial nature. Discussions with the CA Program Manager for the Marine Corps

indicate that, beginning with the inventory for fiscal year 1982 (FY 82), governmental functions will also be reported. The objective, by encompassing all functions performed by a reporting command, is to obtain a "bottom-line" cost figure that can be compared with accounting reports for the same period. This goal is consistent with the principle of achieving an identity between data used in accounting reports and that used in CA reports put forth in the previous chapter. The possible impact of this additional requirement on reporting commands, however, will be discussed in Chapter IV.

E. FIELD LEVEL ADMINISTRATION

The opinion expressed in the previous section, and for that matter any opinion expressed in this presentation, is based on the author's previously stated experience as a CA coordinator. Although conversations with other coordinators confirmed that their experiences and opinions were similar, there was no statistical basis for making general statements relative to the conduct of the CA Program throughout the Marine Corps. For that reason, a survey of all eighteen Marine Corps commands identified as having CA reporting requirements was conducted by the author. The survey was either conducted on-site or by telephone with personnel designated as points of contact by their respective commands.

All commands, versus a sample, were surveyed because the number was small. Any sample of smaller size would not have

permitted an acceptable base from which comparisons could be made or conclusions drawn. Also, it was necessary to determine the total extent of the effort involved in preparation of the inventory as a means of estimating the cost.

The purpose of the survey was to document organizational responsibility, manhours expended on inventories, information relative to persons actually conducting the inventory, and problems encountered in the implementation of the CA Program. Solicitation of responses did not include prompting based on previous responses. The objective was to obtain an understanding of the methodology and issues relative to each command. The questionnaire used in conducting the survey is contained in the appendix. Data obtained in the interviews is presented in Figure II-2 and is further summarized as follows:

1. Organization

Of the eighteen commands surveyed, eight task the Comptroller with conducting the CA inventory, five task their Management Assistance/Analysis Office, four task their Director, Installations and Logistics/G-4/S-4, and one tasks its Internal Control Office which is directly accountable to the Commanding General. In five commands, the Chief of Staff or Executive Officer approves the inventory prior to submission to HQMC and directly assumes overall responsibility for the CA Program. The reason given for this level of involvement was that the Program was considered highly important and such a measure insured the appropriate level of priority within the command.

SUMMARIZATION OF THE RESULTS OF A SURVEY OF
THE COMMERCIAL ACTIVITIES PROGRAM IN THE MARINE CORPS

Command	*Number of functions	Utilize PRIME	Manhours expended on preparation	Pay grade of individual(s) performing inventory	Obtain section input	Years inventory performed by same person	
						≤2	>2
MCLB, Albany	40	X	135	GS-9			X
HQBN, HQMC	4	X	40	O-4	X	X	
MCLB, Barstow	47	(1)	160	GS-9	X	X	
MCAS, Beaufort	33	X	480	GS-5	X	X	
MCB, Camp Lejeune	36	X	50	GS-9	X		X
MCB, Camp Pendleton	54	X	200	GS-7	X	X	
MCB, Camp Smith	10	X	10	GS-11	X	X	
MCAS, Cherry Point	83	(2)	487	GS-5	X		X
MCAS, El Toro	59	X	120	E-6	X	X	
MCAS, Kaneohe Bay	31	(3)	290	GS-11	X	X	
MCFC, Kansas City	9	X	60	GS-11	X		X
MCAS(H), New River	20	X	100	GS-5	X	X	
MCRD, Parris Island	43	X	200	GS-9	X		X
MCDEC, Quantico	48	X	120	GS-11	X		X
MCRD, San Diego	18	X	240	GS-9	X	X	
MCAS(H), Tustin	8	X	(4)	(4)	X	X	
MCAGCC, 29 Palms	30	X	120	GS-12	X		X
MCAS, Yuma	37	X	150	GS-9	X		X

* As reported on last inventory (one each for in-house or contract).

(1) A MKIV program written against PRIME is used to obtain data.

(2) Financial reports generated by CLASS III system are used to obtain data.

(3) Financial reports are used by the individual sections to extract data.

(4) Inventory performed in conjunction with MCAS El Toro. Manhours required reflected in MCAS El Toro's figure.

Figure II-2

2. Methodology

The Class I accounting system for bases and stations in the Marine Corps, referred to as PRIME, was developed by HQMC which also controls all modifications to it. Class III systems are those developed by a particular base or station for their own use. Changes to a Class III system are made by the base or station that developed it and do not require approval by HQMC [Ref. 18].

Sixteen of the eighteen commands surveyed utilize reports generated by or from PRIME to obtain cost figures. The actual reports used are the Navy and Marine Corps (NAVMC) 2168, Operating Budget Expense Report, and/or the NAVMC 10890, Performance Statement (Closeout). Of the remaining two commands, one is not on the Class I system but utilizes comparable reports generated by its Class III system; the other command tasks those sections maintaining cognizance over commercial activities to obtain cost figures from their job order entry cards.

The use of financial reports in all cases involves a manual translation of Cost Account Codes (CAC's) and/or Job Order Numbers (JON's) into corresponding CA functions and subfunctions to determine operating and contract costs. Definitions for CAC's provided in the Navy Comptroller (NAVCOMPT) Manual, paragraph 024640, compared with CA function and subfunction definitions found in MCO 4860.3B serve as the basis for making this translation.

Capital investment reported in the inventory is identified as plant property which is divided into four classes. Class I plant property is land. Class II plant property is buildings, structures, and utilities. Class III plant property is equipment other than industrial plant equipment and consists of items with an initial acquisition cost of $1000 or more. Class IV plant property consists of industrial plant equipment with an acquisition cost of $1000 or more used in the conduct of industrial operations [Ref. 19].

All commands surveyed utilize Plant Property Records to obtain information required on capital investment in land and equipment. This is also done manually and involves coordination with individual sections listed on the property records when a piece of equipment or building cannot be identified to a particular commercial activity (e.g. M151 jeeps which could be used for guard services, taxi service, or some other function requiring the use of a light vehicle).

All but one of the commands rely upon individual sections to provide some input for the inventory. The degree of reliance, however, varies. In the majority of these commands, an analyst utilizes financial reports as the primary means of obtaining cost and workload data; sections are only tasked to provide data for functions that cannot be related to a specific CAC or JON (e.g. the various subfunctions within motor vehicle maintenance). In the remaining commands, sections are

responsible for providing all input by means of their copies of financial reports or the previously mentioned job order entry cards; the analyst serves as a coordinator and checks the input for large variances from previous reports that might be evidence of an error.

3. Manhours Expended

Estimates of the manhours expended on an inventory report varied from 10 to 487 hours. There was in most cases a correlation between the number of functions inventoried and manhours expended in its preparation. It would not be realistic to conclude that a straight correlation should exist. There are differences between commands in the level of effort within a given function, the organization of data, and the experience of personnel that could account for variations not attributable to the number of functions.

Personnel actually conducting the inventory or coordinating the effort range in grade from GS-5's to GS-12's, or their military equivalent. Their efforts constituted approximately ninety percent of the workhours expended with the remaining hours being expended by supervisory personnel of higher grade or military rank.

4. Turnover

In ten of the commands surveyed, the same person had not conducted the inventory for more than two years. In only two commands had the same person conducted the inventory for

five years or more. In several cases where turnover was high, the comment was made that a considerable number of manhours was expended in training the person. In some cases there was no one to train the person assuming responsibility for the inventory and no desk-top procedures. That person was required to learn the procedures on his/her own with an even greater expenditure in training manhours and the potential for introduction of subjective criteria.

5. Inadequate Guidance

Several coordinators expressed concern over what they considered inadequate guidance and the problems that it created. Specific examples included lack of parameters on the computation of indirect costs in the Government cost estimate, and no established reference between CAC's/JON's and CA function/subfunction codes.

Indirect costs chargeable to a given function are derived from the apportionment of total costs accumulated for material overhead, operational overhead, and general and administrative expense. Questions arise as to the highest organizational level that the costs should be accumulated, and the process of separating indirect from direct costs. Present systems are primarily oriented toward accounting for the use of fiscal resources without distinction between direct and indirect costs.

As indicated in the comments of CA coordinators, the lack of a standard reference between CAC's/JON's and CA

functions/subfunction codes forces individual commands to determine their own references. When references, or changes to references, are not documented, it is difficult to be consistent in reporting from one year to the next. It is even more difficult if turnover is high.

The problems identified by CA coordinators in the Marine Corps are consistent with those identified in the United States Army. In a thesis by Captain John S. Everette, An Analysis of Commercial and Industrial Type Activities (CITA) Program Within the United States Army, [Ref. 20] the following conclusion is drawn:

> "The manner in which installations accumulate and account for costs is not correlated to those elements of cost associated with the CITA program."

He further goes on to state that an effort should be made to merge the elements of cost related to CITA's to those of the Standard Army Finance System (STANFINS).

Much of the source of the problems with inadequate guidance can be traced to directives previously described. The publication dates on DoD directives indicate a commitment to respond to the requirements set forth in A-76. However, in the opinion of the author, they are largely repetitive of its provisions, even to the point of reciting them verbatim; they contain little that can be classified as amplifying guidance. Marine Corps Order 4860.3B does provide amplifying guidance, especially in the area of inventory preparation. It is the

author's opinion, though, that the guidance deals more with form than substance. Bases and stations are told what data must be accumulated, but they are not given parameters under which it must be accumulated. This complicates their efforts in that assumptions and subjective determinations must be made that become subject to question when submissions are analyzed and compared.

F. SUMMARY

Policy relative to the CA Program is defined in A-76 and reinforced through repetition in DoD and component directives. Further, as evidenced by the survey taken of Marine Corps commands, the CA Program receives high-level attention and emphasis. Standardized procedures do not exist, however, for performing the tasks associated with its implementation. As a result, personnel in relatively high pay grades devote considerable time to such efforts as the physical preparation of the inventory. Their work is concentrated on the accumulation of data instead of the analysis of it. The question then arises as to whether or not a more efficient means by which data can be gathered and presented exists.

Subsequent chapters present an overview of the Marine Corps Standard Accounting, Budgeting and Reporting System (SABRS), and an analysis of the potential for incorporating CA reporting requirements within it. The objective, of course, is to attempt to provide an answer to the question posed in the preceding paragraph.

III. STANDARD ACCOUNTING, BUDGETING AND REPORTING SYSTEM (SABRS)

A. INTRODUCTION

This chapter provides the reader with an overview of SABRS. This is done in the context of presenting background information, general system design characteristics, and the environment (i.e. hardware, software, and data base management) in which data processing is conducted. In terms of a requirements definition, it identifies the proposed system under which CA data requirements may be met.

B. BACKGROUND

1. References

Unless otherwise indicated, material for this chapter was drawn from the SABRS General System Design Specifications (Draft).

2. General

SABRS was approved as a concept by the Chief of Staff of the Marine Corps on 15 August 1978 [Ref. 21]. The concept envisioned a single financial management system for Marine Corps users to replace existing automated, semiautomated and manual systems. It had been determined that these existing systems had exceeded their useful lives, were untimely, and did not adequately address the scope of management information required. Property accounting, asset depreciation, and

contract accrual accounting, which had been established as General Accounting Office (GAO) and Department of Defense (DoD) standards for financial systems are specific examples of requirements not met by present systems but envisioned for SABRS [Ref. 22].

3. Objectives

Consistent with the concept of SABRS the following objectives were established.

a. General

(1) To provide a standard financial system that will integrate the accounting, budgeting, and reporting functions and replace the present Operations Sub-system (PRIME), Marine Air/Ground Financial Accounting and Reporting System (MAGFARS), Class I Budget System and Class III Allotment Accounting Systems.

(2) To provide a system that will be operational at all Marine Corps commands in support of operating forces, supporting establishments, Marine Corps Districts, Marine Barracks Eighth and I (Washington, D.C.), Henderson Hall (Washington, D.C.), and Headquarters Marine Corps (HQMC, Washington, D.C.).

(3) To provide a system which satisfies all legal and fiduciary requirements imposed by statute or higher authority relative to the administrative control of funds.

(4) To provide a system that satisfies the management information, budgetary, cost, performance measurement, and productivity requirements of the system users.

b. Specific:

(1) Provide the commander and subordinate managers an inquiry capability with a maximum fifteen seconds response time.

(2) Provide the status of funds which will be current as of the last transaction processed at the local level.

(3) Provide financial data, other than fund status (see (2), above), no more than twenty-four hours old.

(4) Provide management with ad hoc reports.

(5) Reduce training requirements by twenty percent.

(6) Reduce input errors by at least fifty percent and correctional process time by eighty percent.

(7) Reduce memorandum records by eighty percent.

(8) Reduce implementation time of directed changes to thirty days.

(9) Reduce hard copy computer input/output by seventy percent.

(10) Meet all directed system standards (i.e., GAO, DoD, HQMC, Privacy Act, etc.).

(11) Provide concurrent processing of all operating budgets/allotments by the supporting automated service center which will reduce processing time and attendant cost.

(12) Be capable of direct input/output with other related systems such as the Marine Corps Standard Supply System (M3S) and the Integrated Disbursing and Accounting System (IDA).

4. Status

An Automated Data System Development Plan (ADSDP) for SABRS was originally published on 31 March 1980 with the latest revision being 8 December 1980 [Ref. 23]. It includes a feasibility study, economic analysis, functional description, and requirements statement as appendices to it. This document has been followed by draft copies of a detailed functional description, and the general system design. Work is presently progressing on detailed design specifications which will be presented to system users in June 1982 for purposes of corroborating their completeness and clarity. The June 1982 date is significant in that it represents the latest point in time at which requirements contained in this presentation should be validated and included in the overall SABRS requirements. As development progresses through the preparation of system specifications, inclusion of requirements forces modifications that could otherwise be avoided.

C. GENERAL SYSTEMS DESIGN

As previously described, SABRS must meet a number of objectives related to the management of physical assets and financial resources. In the course of systems design and programming, one can focus on requirements associated with each of these objectives separately without regard to commonalities existent in other programs, routines, and subroutines that would be redundant in the functions performed and costly to maintain. Further, the opportunity to use commercially available software packages would have been missed because emphasis would have been placed on developing specialized code to perform the particular function at hand. Realizing the unnecessary costs associated with this applications approach to software design, current literature and directives [Ref. 24] on the subject stress a functional approach.

A functional approach to software design involves viewing the data processing function in terms of outputs, inputs, and processing. First, all of the outputs required are identified. Next, the data that must be input to produce the desired outputs is identified. Finally, the necessary processing steps required to convert that data which is input to the desired outputs are identified. By looking at each of these functions in total, recognition can be given to commonalities, and redundancies eliminated. Specifically, the same data element may qualify as input for more than one output requirement, or

common sort and merge routines (preferably those already available) could be used in processing data.

System designers of SABRS have taken a functional approach. The system has been designed in terms of data accumulation, data base update, special financial functions, and information production.

1. Data Accumulation

This area can be equated to data input. It involves the gathering and initial processing of data to include identification, editing, and initial validation.

There are three means by which data may be obtained. First, it can occur by means of conversion of data from other systems. Figure III-1 provides a list of the systems which may contain or generate data having a financial impact. The concept is to capture all data from these systems that in any way affects SABRS outputs.

The second means by which data may be obtained is directly through interactive user transactions. The immediate identification, editing, and validation processes that occur will result in the identification and rejection of erroneous data. The user will then be given an opportunity to re-enter the data.

The final means by which data may be obtained is through off-line data entry. This is envisioned primarily as a backup measure for those situations in which data cannot be entered

SYSTEMS CONTAINING OR GENERATING DATA
WITH FINANCIAL IMPACT

ALPS	--Automated Leave/Payroll System
DOV	--Disbursing Officer Voucher
MCIF	--Marine Corps Industrial Fund
FYDP	--Five-Year Defense Plan
JUMPS/MMS	--Joint Uniform Military Pay System/Manpower Management System
REAL FAMMIS	--Real Time Finance and Manpower Management Information System
DMMS/CAPRS	--Depot Maintenance Management System/Cost Accounting
IDA	--Integrated Disbursing and Accounting
CERPS	--Navy Register System/Centralized Expenditure Reimbursement Processing System
UADPS	--Navy Uniform Automated Data Processing System for Stock Points
REMMPS	--Reserve Manpower Management and Pay System
DSSC	--Direct Support Stock Control System
SASSY	--Supported Activities Supply System
MUMMS	--Marine Corps Unified Material Management System
MIMMS	--Marine Corps Integrated Maintenance Management System
MOWASP	--Mechanization of Warehouse and Shipment Processing System

Figure III-1

interactively or by means of system interface. Classification as a backup procedure would seem to represent a significant advancement from the present method of operation in which off-line is a common means of data entry.

2. Data Base Update

Data is not passed to the data base update function until it has gone through the previously described processes of validation and editing. This serves as a protective measure for the data base to insure that it is not contaminated by erroneous or invalid data. The update function is further broken down into table maintenance, memorandum balance update, and batch update which are explained in greater detail below:

a. Table Maintenance

In processing transactions, a number of tables are used for purposes of cross-referencing information. There are two subfunctions that serve the purpose of keeping these tables current, interactive table maintenance and non-interactive table maintenance. Interactive table maintenance occurs as a result of user transactions that affect a given table and is immediate. Noninteractive maintenance is reserved for those affected tables that are too large to be updated immediately; it is performed as part of the routine nightly batch update.

b. Memorandum Balance Update

As with table maintenance, memorandum balance update occurs as the result of processing interactive transactions that affect the balance. If an insufficient balance exists to

post the transaction, then it will be rejected. The capability also exists within this function to hold those transactions that affect the memorandum balance at a later date (e.g. increased/decreased authorizations, transfers for a new fiscal year, etc.). On the effective date of the transactions, they are processed as part of a normal batch update. The status of the Future Memorandum Balance is available for viewing to insure that transactions included in it are being processed in a proper and timely manner and that, once processed, they are purged.

c. Batch Update

This function performs official accounting. It is divided into the following six subfunctions which represent successive levels of data summarization.

(1) Error Handling. Errors dealt with consist of failed transactions and suspense error transactions.

(2) Transaction Level Update. This is the first level of summarization in which individual transactions accepted from the data accumulation function establish or update the status of transaction records.

(3) Obtain M3S Information. Data that is updated by transactions originated in M3S is examined for financial impact.

(4) Summarizing Level Update. Data obtained in the transaction level update is aggregated and summarized.

(5) Activity Level Update. Activity level budgets and general legers maintained by both field and Headquarters Marine Corps (HQMC) activities are updated at this level.

(6) Major Claimant Level Update. This level is processed at HQMC only. It involves the recording of appropriation funds, issuing of operating budgets, and the updating of Appropriation General Ledgers and Major Claimant Single General Ledger.

3. Special Financial Functions

Consistent with the objective of SABRS relative to support of management planning and control, the following functions are provided:

a. Year end closing

b. Reimbursable billing and collections

c. Statistical analysis

d. Reconciliation

e. Audit

f. Conversion/implementation

Of these, statistical analysis and audit provide the most potential for use in CA applications. It is envisioned that in the area of statistical analysis, projection requirements will be supported by such techniques as forecasting, modeling and sampling. In the area of audit, inspection, sampling, confirmation, comparison, and inquiry techniques will be available, possibly through a generalized audit software package.

4. Information Production

This function can be equated to output. It uses the data that has been accumulated, processed, and aggregated into the formats required. Output requirements are roughly classified as mandatory or optional.

Mandatory requirements consist of external reports produced in response to higher authority, reports mandated by HQMC, and system reports required to monitor internal controls. The Statement of Treasury Department report is generated in response to higher authority whereas the Operating Budget Report is required by HQMC. Examples of system reports include hash totals, record counts, batch controls, and aging of various types of transactions. Additionally, reports depicting the physical structure of the data base, and the frequency and type of optional information production are generated to assist the SABRS Data Base Administrator in maintaining a high level of efficiency in the data base management system.

Optional requirements consist of reports tailored to specific levels of financial management, standardized inquiries, and ad hoc management reports. The Civilian End Strength report is an example of a tailored report; it is under the control of the local financial manager who makes determinations as to its production and use. Standardized inquiries include fund status requests, document status, etc., and may be chosen by the user from a menu called up on his terminal. Ad hoc

management reports address information requirements that cannot be met by standardized inquiry or report generation. The user specifies selection and linking criteria which permit him to retrieve and/or link together data elements desired. With the exception of large requirements which are batch processed, user requirements are handled interactively. Repetitive ad hoc reports are identified and considered for inclusion in the menu of standardized inquiries.

D. SUPPORT ENVIRONMENT

1. Configuration

Data processing support for SABRS will be provided by three Central Design and Programming Activities (CDPA's) and four Regional Automated Service Centers (RASC's). There will be a separate data base for each RASC/CDPA except the CDPA, Kansas City. This CDPA will process expenditures and military pay accounts data only. Each RASC services users at geographically proximate bases and stations by means of networked terminals. Communications between the terminals and the RASC will be provided by the Marine Corps Data Network (MCDN), on-base communication lines, leased lines, or dial-up telephone lines. Figure III-2 depicts the different CDPA's/RASC's and the bases and stations supported by them [Ref. 25].

The number of terminals at each base varies with the workload requirements and dispersion of processing points. Not every user with requirements for data input or output

CDPA'S/RASC'S AND SUPPORTED ACTIVITIES

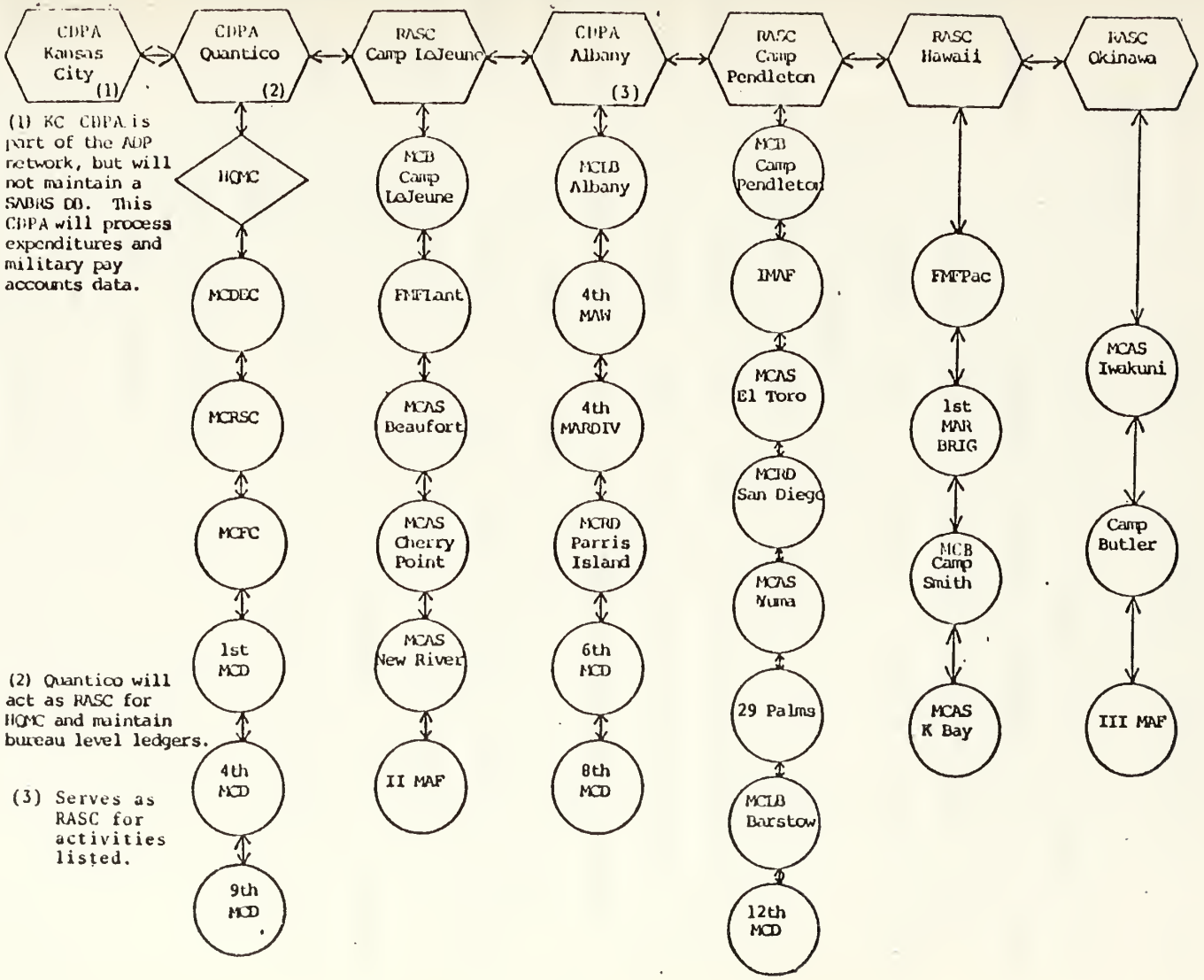

Figure III-2

will have a separate terminal, at least initially. Sharing will be required, with the individual bases and stations determining actual location of terminals allocated to them.

2. Hardware

Implementation of SABRS is predicated on completion of current efforts to upgrade existing hardware at the RASC's/CDPA's. The present International Business Machine (IBM) S/360 computer systems have reached or exceeded their capability to meet SABRS requirements [Ref. 26].

The hardware selected to replace the IBM S/360 is the AMDAHL 470/V7. CDPA's will have the 470/V7A whereas RASC's will have the 470/V7B. Main storage and communication processing capability also vary; the CDPA's will have twelve megabytes of main storage whereas RASC's will have eight megabytes, and the CDPA's will have sixteen channels while the RASC's will have twelve channels. Each computer site will have a COMTEN 36X0 front end processor (FEP) to manage telecommunication resources utilized in the terminal network.

3. Software

a. Operating System

The most current edition of Multiple Virtual Storage (MVS) will be the operating system used. This entails a conversion from the current Multiprogramming with Variable Tasks operating system (OS/MVT). Systems software standards and a conversion plan are presently being developed to accomplish this.

b. Language

Consistent with guidance set forth in DoD Instruction 500.31, Interim List of DoD Approved High Order Programming Languages, SABRS will be programmed in ANSIX3.23-1974 COBOL. The only exception to this would be a user-oriented language that might be included in a data base management system as part of the overall package.

c. Packages

SABRS is designed to maximize the utilization of commercially available software packages. Following are some of the software packages available to perform specific functions in addition to the previously mentioned MVS operating systems. The fact that these packages are not a complete listing but a representative sample provides further indication of the options available to system designers and the potential for cost savings in software development.

(1) DATAMANAGER--A package that develops data dictionaries for Class I systems described in Chapter II. Data dictionaries are required for the subsequent implementation of a Data Base Management System.

(2) ROSCOE (Remote Operating System Conversational Operating Environment)--Provides a remote job entry system for on-line program development and maintenance.

(3) COM-PLETE--A communications monitor that supports the Washington, D.C. CDPA Data Base Management System.

(4) INTERCOMM--A communications monitor that is used for all data processing sites other than the one described in (3). Whether INTERCOMM or COM-PLETE is selected as the standard communications monitor will depend upon the results of testing ADABAS with each for overall interface capability.

(5) MAF (Multiple Access Facility)--A COMTEN Front End Processor software package which provides the interface between user terminals and the host processor.

4. Data Base Management System (DBMS)

Although a DBMS has not been selected for use with SABRS, the system being evaluated is the Adaptable Database System (ADABAS). Developed and marketed by Software AG of North America, ADABAS is a mature DBMS that is presently installed at over 350 sites worldwide [Ref. 27]. It has been purchased by the Marine Corps and successfully implemented with the Manpower Management System (MMS).

In addition to its proven success with MMS, ADABAS has several features that qualify it to be considered attractive for use with SABRS. First of all, it supports concurrent batch and on-line processing by multiple users working in the MVS operating system environment. Second, it interfaces with both COM-PLETE and INTERCOMM. Finally, it utilizes an integrated data dictionary, contains utilities for defining, loading, controlling and maintaining the data base, and provides protection to prevent loss of data due to user error or system malfunction.

ADABAS consists of a Nucleus, Multi-Processing Module (MPM) and a buffer. The Nucleus processes user commands for access to the data base. The MPM coordinates, prioritizes and then queues requests from users. It also produces statistics relative to data base use for accounting, or determination of data elements that are unneeded.

The data base associated with ADABAS is composed of files which can be further broken down into fields. It may contain up to 255 files with up to 500 fields per file. Fields may be added to a file at any time by means of a system utility without reloading or reorganization of the file.

There are two physically separate regions within an ADABAS database. One region, referred to as Data Storage, contains user data compressed into fixed-length records. The other region, referred to as the Associator, contains tables and lists necessary to process data in Data Storage. The following tables and lists are contained in the Associator:

a. Field Description Table

Entries for the name, length, and attributes of fields within a logical file are displayed in this table. This information is available to the user through a READ command.

b. Storage Management Table

This table is used to manage space in the Associator and Data Storage. Entries contain the amount of space allocated to a given file and its location in storage.

c. Address Converter

This is a list of relative block addresses in order by Internal Sequence Number (ISN). Since the ISN for a record never changes, it can be used to track the physical location of the record which does change during processing.

d. Secondary Keys

Inverted lists are used to contain secondary keys. The secondary keys represent a descriptor name and value that can, in turn, be used to obtain a list of ISN's having that value.

Up to 200 fields, subfields, or combinations of fields within a file may be defined as descriptors, or keys. These descriptors support sequential accessing, can be hashed by means of a Boolean combination to permit random accessing of records, and can be used as a common identifier to draw relationships between one or more records.

From the user's point of view, one need only be concerned with data fields required for processing and not the records in which they are physically stored. ADABAS uses the term, "userview," which is defined as a set of fields in certain order, with the format and length of each field specified by the user.

The ability to structure a logical record corresponding to the specified "userview" facilitates the development of routines to produce standard reports. Used in conjunction with a query language, it is also essential to the capability to produce ad hoc management reports.

E. SUMMARY

SABRS, as conceived, is a sophisticated management information system that will exist in a much improved processing

support environment. It attempts to provide the user an information processing capability that is timely and sufficient in scope to address all user requirements presently envisioned or generated in the future.

The next chapter will relate CA reporting requirements presented in Chapter II to the capabilities of SABRS presented in this chapter. Operational, technical, and economic feasibility will be investigated.

IV. COMMERCIAL ACTIVITY REPORTING AS A PART OF SABRS

A. OVERVIEW

Chapter II provided an overview of the Commercial Activities (CA) Program in the Marine Corps and the existing system for obtaining required data. As described, it is basically a system that relies on manual conversion of data in financial reports generated by means of electronic data processing (EDP). Information retrieval under the existing system using computer processing techniques is limited.

Chapter III discussed the Marine Corps' Standard Accounting, Budgeting and Reporting System (SABRS) currently in the development phase. Of special note was the stated general objective that SABRS would satisfy management information requirements of system users. Also significant was the proposed Data Base Management System (DBMS) which permits the structuring of logical records that provide different user views of data resident in the data base.

In view of its objectives and potential capabilities, it is a basic premise of this presentation that SABRS should be considered as the proposed system under which CA reporting occurs. If this premise were accepted, it would follow that CA reporting might be regarded as a subsystem of, or application within, SABRS.

The existing system and proposed system were presented in Chapters II and III respectively. It is the purpose of this chapter to examine the feasibility of including CA data requirements within SABRS.

B. OPERATIONAL FEASIBILITY

1. General

Whether data is extracted manually or by means of EDP, there must be an established relationship between commercial functions and financial accounting categories. The fact that such relationships are presently determined at the reporting command level, and the problems such an arrangement creates, have been described. Relationships dictated by Headquarters Marine Corps (HQMC) to the maximum degree possible would not only help alleviate many of these problems, but is essential to the operational feasibility of incorporating applications for CA data processing in SABRS.

2. Resource Management System (RMS)

One of the actions taken under RMS, which was implemented in the Navy and Marine Corps in fiscal year 1968 through a Priority Management Effort (Project PRIME), was the establishment of an expense account structure for collecting costs. The purpose of expense accounts is to standardize costing procedures. They are as follows [Ref. 28, 29]:

a. Program Element (PE)

This tells who is using the resources such as a particular type of aviation squadron.

b. Activity Group (AG)

This code reflects the primary breakout of financial data used in the programming, budgeting, management and accounting for expenses and gross adjusted obligations contained in operating budgets financed by the Operation and Maintenance Appropriations. An example would be Base Operations-Real Property Maintenance Activities.

c. Subactivity Group (SAG)

The SAG serves the same purpose as the AG but represents a finer functional break within it. Examples within the AG cited above are operation of utilities and minor construction.

d. Cost Account Code (CAC)

This a four digit alphanumeric code which describes the AG/SAG categoreis in more detail. Examples are purchased electricity, preservation and packaging, and motor vehicle maintenance.

e. Elements of Expense (EE)

Expense elements are one digit alpha codes which tell what kind of resources are being used. Examples are military labor, civilian labor, supplies, and contract services.

The method used to collect costs within the expense account structure is a job order cost system which collects

accrued costs for projects, work orders, processes and tasks. Job Order Numbers (JON's) assigned to a given process or task must be able to produce accrued costs to the activity group, subactivity group, cost account, and expense element levels. They must also be structured such that they provide details at any level desired by local management [Ref. 30].

3. SABRS

Under SABRS, the job order structure consists of an alphanumeric code. This code is a physical structure in which the first five characters identify the command accruing costs and the remaining characters constitute the JON [Ref. 31].

A logical record referred to as the Master Job Order Number (MJON) record is established for each JON. It is actually the MJON record, utilizing the Job Order Identification as a key, that provides the means to respond to RMS requirements for cost accumulation set forth in the previous section. Its structure is determined by the particular requirements that apply to the appropriation or fund against which costs are being accumulated [Ref. 32].

4. CA Data Requirements

The expense account structure within RMS is well defined and provides a basis for the efficient and consistent accumulation of cost data. Working within this structure, relationships can be drawn between commercial functions and cost data. It has been the author's experience that the

relationships vary depending on the function and whether or not inventory data is required for commercial subfunctions. In many cases, a one-to-one relationship can be drawn between CAC and commercial function. In others a one-to-many relationship exists between CAC and commercial function and vice versa. In those cases where the relationship is one-to-many between CAC and commercial function, the MJON record serves as a means of obtaining the level of detail required for CA data presentation.

There are some cases in which no clear relationship can be established between a commercial function/subfunction and a CAC. An example of this is motor vehicle maintenance (CAC 6200) which is further subdivided by type of vehicle (i.e. sedans, buses 37-passenger and under, buses 38-passenger and over, etc.). Subfunctions within the commercial function, motor vehicle maintenance, consist of battery maintenance and repair, body repair and painting, etc. In these cases, local management would have to add an additional field to the MJON record to depict the relationship desired.

Once relationships have been established, the data base can be structured in such a manner that applications can be written to draw upon it for CA data requirements. Again, though, direction from HQMC is necessary to organize the effort and achieve the level of consistency required.

C. TECHNICAL FEASIBILITY

1. System Impacts

Total workload requirements have not been established for normal SABRS data processing. Also, it remains to be determined what the impact will be on terminal response time and Central Processing Unit (CPU) efficiency of ad hoc requests. When SABRS becomes totally operational, ad hoc requirements may reach such a volume that the objective of fifteen-second response time will not be possible. In view of this, a quantitative assessment of the impact on terminal response time and CPU efficiency of incremental requirements relative to the CA Program cannot be made. CA data processing requirements must be included as a part of the total requirements when they are established to properly determine impact.

Although a quantitative assessment of impact cannot be made, it is possible to argue in general terms that CA data requirements can have a negligible impact on SABRS. As previously described, the CA inventory report is required on a yearly basis. Interactive processing is not required. Batch processing, which would be the preferred mode, would permit processing of the inventory report to be scheduled such that it does not interfere with the other mandatory requirements. The inventory report could not be relegated to the end of the processing queue indefinitely because of deadlines associated with it. However, the important consideration is that the inventory report, by virtue of its relative

infrequency and limited use of the system resources, does not present a significant scheduling problem to managers of the Regional Automated Service Centers (RASC's).

Data requests associated with preparation of an in-house cost estimate in an interactive mode present more of a potential for negative impact on terminal response time and CPU efficiency. If these requests are made in an overloaded system, or one approaching overload, then they will reduce terminal response time for all users, possibly below a minimally acceptable level. Again, interactive processing can be considered desirable, not mandatory. The requirement for obtaining CA data in an interactive mode must be assessed in relation to all other requirements and priorities determined accordingly. If necessary, data required in preparation of an in-house cost estimate could be obtained by means of batch processing.

2. Data Base Management System

It is the purpose of a DBMS to establish and maintain user specified logical relationships between elements of data stored in a centralized data base [Ref. 33]. Adaptable Database System (ADABAS), the DBMS described in Chapter III, represents one of a number that are available commercially. Whether ADABAS is selected as the DBMS to be used with SABRS or not, the DBMS concept itself, which is an integral part of SABRS, is important to the processing of CA data requirements. It

provides the capability to establish logical relationships between elements in the data base for CA processing. These relationships are independent of the logical relationships required for the processing of financial or other managerial data requirements. Just as this concept makes it possible for the user to obtain ad hoc management reports, it also makes it possible to extract data in a format required by CA applications as long as a relationship can be established.

D. ECONOMIC FEASIBILITY

1. Cost Savings

Figure IV-1 represents a comparison of estimated costs of preparation of the CA inventory report using present methods and the proposed method of making it an application within SABRS. Rationale and background information relative to the methodology used in making cost projections is as follows:

a. Present Method

Chapter II provided a breakdown by reporting command of the estimated number of manhours expended in the preparation of a CA inventory and the pay grade of the individual(s) actually performing it. For civilians, present basic labor rates (step five) obtained from wage schedules issued by the Office of Civilian Personnel, Navy Department, plus a fringe of twenty-six percent, as required by the Cost Comparison Handbook, were used to determine the hourly cost

ECONOMIC ANALYSIS-PRESENT AND PROPOSED METHODS OF MEETING CA DATA REQUIREMENTS

(Cost $000)

	Development Phase	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
(1) Present Method	-0-	37	37	37	37	37	37	37	37
(2) Proposed Method	29	16	6	6	6	6	6	6	6
(2) - (1)	(29)	21	31	31	31	31	31	31	31
Discounted @ 10%	(29)	19	25	23	21	19	17	15	14
NPV (Dev-Yr 8)									=$124K

Detail:

(1) Present Method

Paygrade	Manhours	x	Hourly Cost of Labor	=	Labor Cost
GS-5	1067		$ 8.82		$ 9411
GS-7	200		10.94		2188
GS-9	935		13.37		12500
GS-11	480		16.18		7767
GS-12	120		19.39		2327
E-6	120		9.53		1144
O-4	40		20.31		813
					$36150 ($37K rounded up)

Figure IV-1

(2) Proposed Method

Symbols: A-Systems Analyst, CA-Management Analyst, P-Programmer, D-Data Transcriber

	Development Phase	Yr 1	Each Subsequent Year
(a) Programming	P(GS-9)-200MH	P(GS-9)-100MH	P(GS-9)-50MH
(b) Testing	P(GS-9)-50MH A(GS-11)-20MH	P(GS-9)-30MH A(GS-11)-20MH	
(c) Documentation	P(GS-9)-30MH	P(GS-9)-40MH	P(GS-9)-10MH
(d) Conversion	CA(GS-11)-800MH A(GS-11)-100MH P(GS-9)-400MH D(GS-5)-500MH	CA(GS-11)-350MH D(GS-5)-70MH	
(e) Operation (Data maintenance-accuracy and validity checks)		CA(GS-11)-400MH D(GS-5)-50MH	CA(GS-11)-300MH D(GS-5)-25MH
(f) Summary	GS-5, 500MH@$8.82=$ 4410 GS-9, 680MH@$13.37= 9092 GS-11, 920MH@$16.18=14886 Totals $28388 or $29K	20MH=$ 1058 170MH= 2273 770MH= 2459 $15790 $16K	25MH=$ 221 60MH= 802 300MH=4854 $5877 $6K

Figure IV-1 (cont.)

of civilian labor. In the case of military labor, composite rates taken from paragraph 035750 of the Navy Comptroller Manual were used. The hourly cost of labor was multiplied by the number of manhours expended at each command to compute labor cost. Labor costs were then totaled to develop a cost estimate for inventory preparation throughout the Marine Corps.

This figure does not include labor costs associated with reviewing the prepared inventory since that function is independent of the mode of preparation. Further, it does not include the cost of inventorying governmental functions. The increased cost relationship would not likely be linear as governmental functions are added, but it would be significant. Finally, this figure does not reflect variations that might occur over the comparison period as a result of unforeseen turnover and corresponding lack of experience in personnel performing the inventory.

b. Proposed Method

Incorporating CA applications in SABRS would require significant one-time effort to establish reference tables, load data not already resident in the data base, and assess the impact of this requirement on other applications. This effort is reflected by estimates of labor that would be incurred during the development phase and initial stages of the implementation phase (i.e. the first year). It involves both analyst personnel and data transcription personnel.

Once the data is loaded and reference tables are established, in the author's opinion, very little maintenance would be required on data elements unique to CA (e.g. designator, state, function, etc.). All other items such as labor costs, material costs, and cost of facilities and equipment would be maintained as part of the financial or asset accounting process; their maintenance would not represent a cost solely attributable to CA requirements. Reductions in data maintenance costs are reflected in the second through the eighth years of the cost comparison. As can be seen by the analysis, it is estimated that the proposed method will save a discounted amount of approximately $124K over the life cycle of SABRS in the inventory of commercial functions alone.

2. Other Benefits

The establishment of reference tables in the data base for stating the relationship between commercial functions and expense accounts permits more than production of the inventory. It also provides the capability to extract historical data useful to the conduct of the in-house cost estimate. For example, the user can determine manhours and direct material expended on a given CA function as a basis for determining these figures in the in-house cost estimate. If this data can be extracted in an interactive or batch mode, then savings can be realized over manual extraction in the same way they would be realized in the preparation of the inventory.

The accuracy and consistency of data will also improve. When data is being interpreted and processed by different personnel at each command, inaccuracies in the individual inventory and inconsistencies in the overall Marine Corps inventory can occur. Although data will still be vulnerable to input errors, those errors resulting from manual conversion can be eliminated.

E. SUMMARY

In this chapter, the feasibility of utilizing SABRS to meet CA data requirements was examined from several viewpoints. Operational feasibility in terms of being able to establish data relationships exists but is contingent on obtaining guidance that establishes the relationships desired. Technical feasibility, as it pertains to being able to process CA data within the parameters set for terminal response time and CPU efficiency, cannot be determined at this time. The need for assessment in relation to total requirements was established. Economic feasibility exists and will possibly become even more pronounced when governmental functions are added to the inventory. Economic feasibility and the additional benefits that can be derived present a strong argument for consideration of the functional requirements set forth in the next chapter.

V. FUNCTIONAL REQUIREMENTS

A. GENERAL

1. Purpose

The purpose of the Commercial Activities (CA) subsystem within the Standard Accounting, Budgeting and Reporting System (SABRS) is to provide the capability to draw on the SABRS data base to meet CA data requirements utilizing automated data processing equipment associated with the Regional Automated Service Center (RASC) concept.

2. References

The functional requirements identified in this section are presented in accordance with the guidance set forth in Federal Information Standards Publication 38 (FIPS PUB 38), "Guidelines for Documentation of Computer Programs and Automated Data Systems Documentation Standards," 13 September 1977. The Cost Comparison Handbook (CCH) and Marine Corps Order (MCO) 4860.3B serve as reference points for identifying specific data elements, and data conversion routines required to meet CA reporting requirements.

B. SYSTEM SUMMARY

1. Background

Software developed to process data required to meet CA reporting requirements will be integrated with SABRS. It

will draw on already defined data fields where possible and utilize established routines for data manipulation. Development of additional routines/subroutines will be restricted to those required for unique output formats.

2. Objectives

The objectives of CA applications within SABRS are as follows:

a. To produce the annual CA inventory report in the format required by Headquarters Marine Corps (HQMC) as part of normal daily batch processing.

b. To provide the data accumulation and query capability required to develop cost estimates for operating expenses, overhead, labor, and capital investments in a given CA category or subcategory.

c. To provide the capability to sum cost estimates for all subcategories within a given category.

d. To provide the capability to sum all CA categories at a given base or station to determine a total cost for the Base Operating Support function.

3. Existing Methods and Procedures

Existing methods of conducting inventories and cost comparisons were presented in Chapter II.

4. Proposed Methods and Procedures

a. Summary of Improvements

Proposed methods and procedures for meeting CA data requirements will eliminate the manhours dedicated to data accumulation for the inventory. Manhours can be expended on the inventory as required to analyze data and confirm its accuracy. Consistency in data presentation from one year to the next will be significatnly improved. The capability

provided by SABRS to conduct statistical analyses of data and make projections based on those analyses will facilitate determination of the most economical method of performance and its cost.

b. Summary of Impacts

(1) Equipment. There will be no impact on equipment. Assets proposed to support SABRS, to include networked terminals at supported bases and stations, will be sufficient to also support CA reporting without adversely affecting SABRS. As established by objective, it is intended that processing relative to the inventory be done as part of batch processing during periods of low demand on equipment resources. Data retrieval relative to the preparation of cost estimates could also be incorporated into normal processing. Those occasions in which immediate response via data terminal were required would be negligible; they would not pre-empt other user requirements or cause a degradation in processing capability.

(2) Software. The proposed Data Base Management System, ADABAS, or an equivalent, will meet data accumulation, update, and manipulation requirements. However, routines performing the following functions will have to be developed to meet report generation requirements:

(a) Convert civilian and military manhours to manyear equivalents (i.e. divide manhours by 2080 and round to the nearest whole);

(b) Sum military and civilian labor costs associated with a given CA category to produce total cost; divide by one thousand for display purposes, right justify, and zero fill;

(c) Divide material and supply costs assigned to a particular CA category/subcategory by one thousand for display purposes;

(d) Provide report headers in the format required for the CA inventory report.

(3) Organizational. There will be no organizational impact in terms of personnel reductions. Responsibility for data accumulation and maintenance will be even more strongly identified with the comptroller/financial management effort. Management analysts whose position descriptions include CA responsibilities will perform more analysis and less accumulation of data, resulting in a greater level of effectiveness.

(4) Operational. Operational impact is negligible. CA requirements presently occur on a "once-a-year" (inventory) or ad hoc (cost comparison) basis. There would be no requirement to modify processing procedures or personnel assignments.

(5) Developmental. CA reporting requirements can be integrated into the overall SABRS development effort. Programming is limited to requirements identified in 4b. Testing of routines developed would be a small part of the overall SABRS implementation effort.

5. Assumptions and Constraints

a. That capabilities set forth as requirements for SABRS will in fact be provided upon implementation.

b. That a comprehensive definition of what constitutes overhead factors will be provided.

c. That a cross reference between commercial functions and Department of the Navy standard Cost Account Codes (CAC's) will be established for purposes of standardization throughout the Marine Corps. Individual bases and stations could continue making their own determinations. However, this would constrain the use of standardized software for inventory report generation, resulting in continued manual preparation supplemented by queries of the data base.

C. DETAILED CHARACTERISTICS

1. Specific Performance Requirements

a. Accuracy and Validity

Mathematical calculations will be carried out to three decimal places and rounded to two decimal places. Input data will be provided to within two decimal places. Transmitted data will be expressed to the nearest whole unit.

b. Timing

Throughput time for inventory requirements will not exceed the sixteen hours established for a SABRS batch cycle update. Processing of inventory requirements, however, will not interfere with daily requirements and will be accomplished during non-prime hours. Standardized queries for data relative to preparation of the government cost estimate will be within 15 seconds. Response to ad hoc queries will be provided within twenty-four hours.

2. Functions

a. Inventory

Software used in support of CA requirements will provide for accessing year-end closeout figures for manhours expended, operating costs, and capital investment in all functions (i.e. commercial and governmental) performed by the reporting command. For inventory purposes it will express total manhours to the nearest whole manyear, and it will express accumulated operating costs and capital investment to the nearest thousand dollars.

b. Cost Estimates

In addition to access to data on capital investment, software used in support of the cost estimate will provide the user the capability to access current cost figures for material and labor used in performing the subject function. Additionally, it will provide the capability to project these figures on an annual basis. Finally, it will provide the user the capability to access current price information for items of material using Federal Stock Numbers (FSN's) or National Stock Numbers (NSN's) as keys.

3. Inputs-Outputs

Inputs will consist of physical CA records stored on magnetic tape in the format of Figure V-1 and a logical record developed by the data base management system in the format of Figure V-2. Outputs will consist of an inventory report in

PHYSICAL RECORDS

Function	Designator	State, Territory or Possession	Reason for In-house Performance	Most Recent Year In-house Operation Approved	Year CA Scheduled for Next Review	Cost Comparison Study Number

Commercial Function Performed In-House

Function	Designator	State, Territory or Possession	Contract Number	Date Contract Award	Date Contract Completion

Reason for Contract Operation	Most Recent Year Contract Approved	Year Contract Scheduled for Next Review	GOCO Code	Small Business

Commercial Function Performed by Contract

Figure V-1

LOGICAL DATA RELATIONSHIPS

Function	JON	UIC	Expense Element	Contract Work-year Equivalents	Contract Cost

Contract Costs

Function	JON	UIC	Expense Element	Civilian Labor Hrs	Civilian Labor Cost

Civilian Labor

Function	JON	UIC	Expense Element	Military Labor Hrs	Military Labor Cost

Military Labor

Function	JON	UIC	Expense Element	Cost of Supplies and Materials

In-House Materials and Supplies

Property ID Number	Function	UIC	Description	Acquisition Cost Chargeable to CA Function

Capital Investment

Figure V-2

the format of Figure V-3 and responses to such queries as material cost, direct labor cost, and capital investment.

Data contained on the physical records can be printed exactly as described prior to producing the inventory report for purposes of verifying accuracy and validity. Those tasked with verifying it would be the individual section responsible for the subject commercial function.

4. Data Characterisitcs

a. Data Fields

Figure V-4 provides a list of those data fields, or elements, that would be used to meet CA requirements. The distinction between those data elements already defined for SABRS and those unique to CA requirements should be noted.

Those data fields unique to CA are resident on the physical record and are virtually static. They would be updated on a periodic basis, possibly no more often than annually.

Data contained in logical records, with the exception of capital investment, corresponds to that already defined for SABRS and is dynamic. Obligations for contract costs, materials and supplies, civilian labor, and military labor are continuously changing by means of the SABRS Data Accumulation and Data Base Update functions already described in Chapter III. During a fiscal year, this data would be resident on random access devices to accomodate query requirements also

COMMERCIAL ACTIVITIES
INVENTORY REPORT
(IN-HOUSE)

UIC: Report for Period Ending:

STATE: Page 1

FROM: TO: COMMANDANT OF THE MARINE CORPS
CODE LPF-4
WASHINGTON, D.C. 20380

FUNC	CIV WKLD	MIL WKLD	LABOR COST	COST MAT	COST FAC/	R S N	APP	NEXT REV	PE	CC NUM

Figure V-3

COMMERCIAL ACTIVITIES
INVENTORY REPORT
(CONTRACT)

UIC: Report for Period Ending:

STATE: Page 1

FROM: TO: COMMANDANT OF THE MARINE CORPS
CODE LPF-4
WASHINGTON, D.C. 20380

FUNC	CONTRACT NUMBER	SOURCE	AWARD DATE	COMPL DATE	WK-YR EQUIV	COST	REASON	APP	NEXT REV	PE	GOCO	SB

Figure V-3 (cont.)

COMMERCIAL ACTIVITY PROGRAM DATA ELEMENTS

DATA ELEMENT DESCRIPTION	ACRONYM	FIELD SIZE	UNIQUE TO CA	STATIC	DYNAMIC	INPUT	OUTPUT
Contract Number		13	X	X		X	X
Contract Work-Year Equivalents		6	X		X	X	X
Cost Account Code	CAC	6		X		X	X
Date Contract Award		4	X	X		X	X
Date Contract Completion		4	X	X		X	X
Designator		1	X	X		X	X
Expense Element	E/E	2		X		X	
Function		5	X	X		X	X
GOCO Code		1	X	X		X	X
In-House Facilities/Equipment		7			X	X	X
In-House Labor		8			X	X	X
In-House Supplies		7			X	X	X
In-House Civilian Workload		6			X	X	X
Job Order Number	JON	11		X		X	
Military Workload		6			X	X	X
Military Labor Cost		8			X		X

Figure V-4

DATA ELEMENT DESCRIPTION	ACRONYM	FIELD SIZE	UNIQUE TO CA	STATIC	DYNAMIC	INPUT	OUTPUT
Program Element	PE	6		X		X	
Property Description		51		X		X	X
Property ID Number		11		X		X	X
Reason		1	X	X		X	X
Small Business		2	X	X		X	X
Source		6	X	X		X	X
State, Territory, or Possession		2	X	X		X	X
Study Number		9	X	X		X	X
Unit Identification Code	UIC	6		X		X	X
Year Approved		2	X	X		X	X
Year-Next Review		2	X	X		X	X

Figure V-4 (cont.)

previously described for SABRS and development of the in-house cost estimate. Subsequent to the end of the fiscal year and completion of year end accounting reports, data would likely be resident on magnetic tape. Because of its relative infrequency and small size, efficiency of processing the inventory report utilizing data extracted from either medium would be virtually the same.

Repeating fields as designated are required for the following reasons:

(1) costs relative to one commercial function accumulated under more than one JON, or

(2) more than one item of capital equipment used in the performance of a commercial function. Although possible, it is unlikely that more than one contract number could correspond to one commercial function. Any contract of reportable size (i.e. over $100,000) would likely be the only one awarded for a given function.

b. Tables

Tables or pointers will be required to relate JON's to commercial functions and serial numbers or identification numbers of capital equipment to commercial functions. The number of JON's for a given function will vary by function and reporting command; it is dependent on the manner in which each command has structured its JON's to capture operating costs chargeable to standard Cost Account Codes. However, in most cases it will be a one-to-one, or two-to-one relationship between JON and function.

The same would apply to serial numbers of capital equipment. Most items of equipment are utilized solely in the performance of one function. It is primarily buildings in which more than one function is performed that the acquisition cost would have to be broken down and charged to functions on the basis of square footage occupied.

In both cases, commercial function would be established as the primary key upon which relationships between data are drawn.

c. Data Storage

Data storage requirements will vary at each RASC. This is due to the number of functions reported by bases and stations, the structure of their JON files, and the manner in which capital functions are related to CA functions. These factors impact on the volume of unique CA data and the size of reference tables required to relate cost data to CA data. The Data Base Management System (DBMS) and the means by which relationships are drawn will also affect data storage requirements. For these reasons, a realistic determination of data storage requirements can not be made at this time.

5. Failure Contingencies

SABRS defines three levels of process interruption. Level I is less than one day, Level II is less than one week, and Level III is more than one week. Classification of jobs with respect to the impact of various levels of interruption will be accomplished. To minimize the effect of interruptions,

each RASC is tasked with developing a contingency plan that includes backup processing sites, prepositioning of special supplies, off-site storage, etc. [Ref. 34].

Planning for interrupted processing of SABRS will suffice for CA requirements. Inventory preparation will not be affected by a Level I or II interruption and should not be given priority over processing of financial transactions. A Level III interruption will adversely affect timely preparation of the inventory unless some priority of processing is provided. Again, however, priority of the inventory should be established relative to the importance attached to timely submission of each job in the queue.

D. ENVIRONMENT

1. General

No additional equipment support in excess of that already defined for SABRS will be required. No additional software support other than that described in B is required. It is assumed that the DBMS selected for use with SABRS, if it is not ADABAS, will have the capability to formulate logical records, providing the views of the data described earlier.

2. Security and Privacy

Under normal circumstances, there are no national security requirements associated with the processing of a CA inventory or government cost estimate. Neither is there a

requirement to access or utilize data of a personal nature that is protected under provisions of the Privacy Act of 1974. There is, however, opportunity to access data and present it in a format that would give competitive advantage to civilian contractors seeking to perform a function or group of functions. As such, queries of the data base for data to be used in preparation of the in-house cost estimate must be controlled through approved passwords or other positive security measures.

E. DEVELOPMENT PLAN

Development of software required to extract, process, and present data contained in a CA inventory report or in-house cost estimate will continue in conjunction with development of SABRS, subject to approval by Headquarters Marine Corps as a valid requirement. Data elements not already defined for SABRS will be added to the data dictionary. Routines or subroutines required to provide standard output formats will be developed along with those developed to meet other report requirements. Development phases for SABRS and the relationship of CA requirements in its development plan are as depicted in Figure V-5.

F. SUMMARY

This chapter attempted to set forth user requirements in a format acceptable and familiar to designers of systems using

POSSIBLE TIMING OF CA DATA REQUIREMENTS
IN SABRS DEVELOPMENT LIFE CYCLE

INITIATION	DEVELOPMENT			EVALUATION	OPERATION	
Initiation	Definition	Design	Programming	Integration, Test, Installation	Maintenance	Revised Operation

INCLUSION OF

CA DATA REQUIREMENTS

Figure V-5

electronic data processing. When specific requirements could not be provided, such as data storage, discussion focused on the factors that prevented such provision. It was the objective of this chapter to serve as a working document for incorporating CA data requirements in SABRS.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

Revision 4 to Office of Management and Budget Circular No. A-76, Policies for Acquiring Commercial or Industrial Products and Services Needed by the Government (A-76), sets forth policies for fair and efficient management of functions that, by their nature, could be performed by either the public or private sector. Bases and stations on which the functions are performed represent the level most involved in daily management of commercial activities. It is at this level that inventories of commercial activities (CA) and comparisons between cost of in-house and commercial performance are performed. Data contained in cost comparisons and inventories is of considerable interest to those affected economically. Congress has also become involved in matters pertaining to implementation of the CA Program. Congressional interest has been expressed in the form of specific restrictions placed on funding authority and the exercise of approval authority over such decisions as changes in the method of performance.

The intensity of interest and oversight has increased the visibility of managerial decisions relative to the CA Program. Requirements to balance an emphasis on the private sector and social policy relative to small business against the most

economical performance have made these decisions exceedingly complex. This, coupled with the review and approval process to which decisions are subjected, create an environment in which the ability to rapidly accumulate accurate information in support of management is extremely important.

It was the purpose of this thesis to present existing policy and directives pertaining to the CA Program, and the organization and methodology employed at Marine Corps bases and stations to respond to the requirements of these directives. It was also the purpose of this thesis to investigate the feasibility of utilizing the Standard Accounting, Budgeting and Reporting System (SABRS) being developed by the Marine Corps to provide timely management information of the quality required to successfully manage the CA Program.

In attempting to fulfill the stated purposes, background information was provided on the directives applicable to the CA Program. Discussion centered not only on the specific guidance provided but also on the effectiveness of that guidance. Surveys of Marine Corps bases and stations confirmed that organizations had been established to address requirements in directives utilizing, for the most part, data contained in existing financial reporting systems. The method of extraction, however, was primarily manual.

Individuals representing bases and stations surveyed indicated that they were not satisfied with the effectiveness and efficiency of manual data extraction. Some have attempted

to develop means of querying files containing financial data using the existing system with varying degrees of success. All enthusiastically supported provision within any future financial system for extracting data required for inventories or cost estimates.

The author then investigated SABRS, which will replace existing financial systems, as to the technical, economical and operational feasibility of utilizing it to produce reports and data in support of the CA Program. Since all workloads for SABRS have not been totally defined, it was difficult to assess the impact of CA requirements on processing time and terminal response time. However, it was argued that the impact would be negligible based on the infrequency of processing requirements and the capability to schedule them into low usage periods.

Economic feasibility was determined by comparing the cost of current procedures with the use of SABRS. It was recognized that a large portion of the cost of utilizing SABRS would be incurred during development and implementation. Once data is formatted with proper keys, and reference tables are established, it can be maintained with considerably less effort.

Operational feasibility focused on variations in structures between data accumulation in support of financial reporting and that in support of CA. As examples indicated, these variations

were the most evident in subfunctions of commercial functions. At that level, it becomes more difficult to relate standard Department of the Navy Cost Account Codes (CAC's) to CA descriptions. Elimination of the requirement to present inventory data to the subfunction level considerably reduces the magnitude of this problem.

Having established feasibility, functional requirements were presented. It was the purpose of the functional requirements to express user needs to those tasked with development of SABRS. If deemed acceptable as a concept, CA functional requirements could be incorporated with those already defined.

Conclusions and recommendations presented in subsequent sections are based on the author's perspective as developed during the course of the previously described presentation and investigation. Recommendations are oriented towards those actions and decisions required to improve the quality and efficiency of management information used in the implementation of the CA Program.

B. CONCLUSIONS

CONCLUSION 1. Marine Corps bases and stations are giving a high priority in terms of managerial attention to the CA Program. Several have or are in the process of obtaining additional billets to perform inventories and in-house cost estimates. High level management, such as the Chief of Staff, is involved in personal supervision of the CA Program, and

upper level (i.e. GS-7 to GS-11) personnel are tasked with its day-to-day implementation.

CONCLUSION 2. Bases and stations within the Marine Corps do not presently have an adequate reporting system for accumulating and presenting data on commercial activities. Present manual extraction of data is time consuming, can lead to inaccuracies, and does not effectively utilize personnel engaged in it. Efforts to extract data from the existing financial reporting system utilizing electronic data processing are fragmented and limited in scope. Resources have not, and will not be, made available to modify the existing system to provide a comprehensive addressal of CA requirements because of priority given to development of SABRS.

CONCLUSION 3. Present guidance does not adequately address the parameters under which data is to be accumulated. Specifically, there is no relationship drawn between CA functions and standard Cost Account Codes, or any other accounting category that could be used as a basis for determining labor and material costs.

CONCLUSION 4. The development phase provides the best opportunity for incorporating additional requirements into a system. Data relationships for standardized inquiries have not been finalized, and additional standardized requirements can be addressed with minimal cost and disruption.

CONCLUSION 5. Assuming that relationships between CA functions and accounting codes can be adequately resolved,

inventory reports can be produced by SABRS. Further, the data relationships and reference tables established to support production of an inventory report also permit the extraction of data to produce an in-house cost estimate.

C. RECOMMENDATIONS

The following recommendations represent the author's view of actions that can be taken to resolve the issues highlighted in the above conclusions.

RECOMMENDATION 1. Headquarters Marine Corps (HQMC) should formally recognize that present procedures for extracting and presenting data required by the CA Program are unsatisfactory. The cost of present procedures has reached a point that it becomes questionable as to whether the value of information gained exceeds its cost. The cost will be compounded by the requirement to also provide an inventory of governmental functions. Every function that a given base or station performs can be classified as governmental or commercial. Therefore, the situation exists such that manual procedures would be used to present in a different format the accounting data produced by an automated system whose reason for existence is the elimination of manual data processing.

RECOMMENDATION 2. The Director, Installation and Logistics, HQMC, should provide a comprehensive list of CAC's under which costs are accumulated for specific CA functions. Bases and stations could then structure their Job Order Number files

such that JON's within a given CAC support CA data requirements. This would promote consistency between inventory reports submitted to HQMC. Standardization would also reduce the amount of personnel training caused by turnover in CA management billets. Finally, it would facilitate the transfer of manual data accumulation procedures to an automated reporting system.

RECOMMENDATION 3. HQMC should designate SABRS as the reporting system to address CA data requirements. Immediate designation would permit unique data fields to be added to the data dictionary and, subsequently, the data base. The data base could be organized and routines/subroutines developed to produce the standard inventory report. The user's manual and other support documentation could be drafted to include specific guidance on formulating userviews required in support of in-house cost estimates.

RECOMMENDATION 4. HQMC should assimilate existing programs that have been written to assist in extraction of CA data from the existing financial reporting system. Marine Corps Recruit Depot, San Diego, and Marine Corps Supply Center, Barstow, have written either MKIV or Class III programs to extract data. With little or no investment in programming or systems analysis resources, HQMC can perhaps distribute these programs for use throughout the Marine Corps. This would assist bases and stations in conduct of inventories prior to implementation of SABRS.

D. SUGGESTIONS FOR FURTHER STUDY

It is recommended that the following areas be considered for further study:

1. Investigate the use of forecasting, modeling, and sampling capability provided by SABRS in developing an in-house cost estimate.

2. Methodology for accumulating data in support of an in-house cost estimate of the entire base operation's support function (i.e. all functions of a commercial nature) should be investigated. It should be determined whether or not this can even be accomplished utilizing existing manual procedures.

3. There should be some determination as to the effect on the CA Program of accounting for depreciation of capital assets. If depreciation rates are established and applied on the basis of groups of like items, then how are CA inventories affected? Is acquisition cost maintained as the basis for valuing capital assets, or are other measures such as book value used?

There will not likely be a better opportunity anytime in the near future to provide CA managers with efficient information processing. Any thoughts, ideas, or further study relating CA requirements to SABRS would be of interest to the author and would seem to be of value to the Marine Corps.

APPENDIX

QUESTIONNAIRE USED IN CONDUCTING INTERVIEWS RELATIVE TO THESIS RESEARCH

Activity _____

Date of Interview _____ Person Interviewed _____

Time of Interview _____ Job Title _____

1. What staff officer is responsible for the CA Program? (military/civilian)

2. Who performs CA Inventories? (Staff section, job title, description) (military/civilian)

3. Are financial reports generated by PRIME used to conduct inventories?

4. Are CA functions correlated to Cost Account Codes? Job Order Numbers? Other classifications?

5. Which of the following reports are used in conducting inventories?

   NAVMC 2168--OpBud/Expense Report
   NAVMC 10890--Performance Statement (Closeout)
   Plant Property Records (Classes I, II, III, and IV)
   NavCompt 265--Acquisition Data Forms
   DD Form 1342--DoD Property Record
   Other

6. Do individual sections provide input for inventories (e.g. motor vehicle maintenance, vehicles chargeable to a particular function)?

7. Is electronic data processing used in any way to present CA inventory results? In what way?

8. Has the same person performed the inventory for your command for more than the last five years? three years? one year?

9. How many manhours are spent in conducting an inventory?

10. Who reviews CA inventory reports prior to submission?

11. Additional comments/impressions?

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